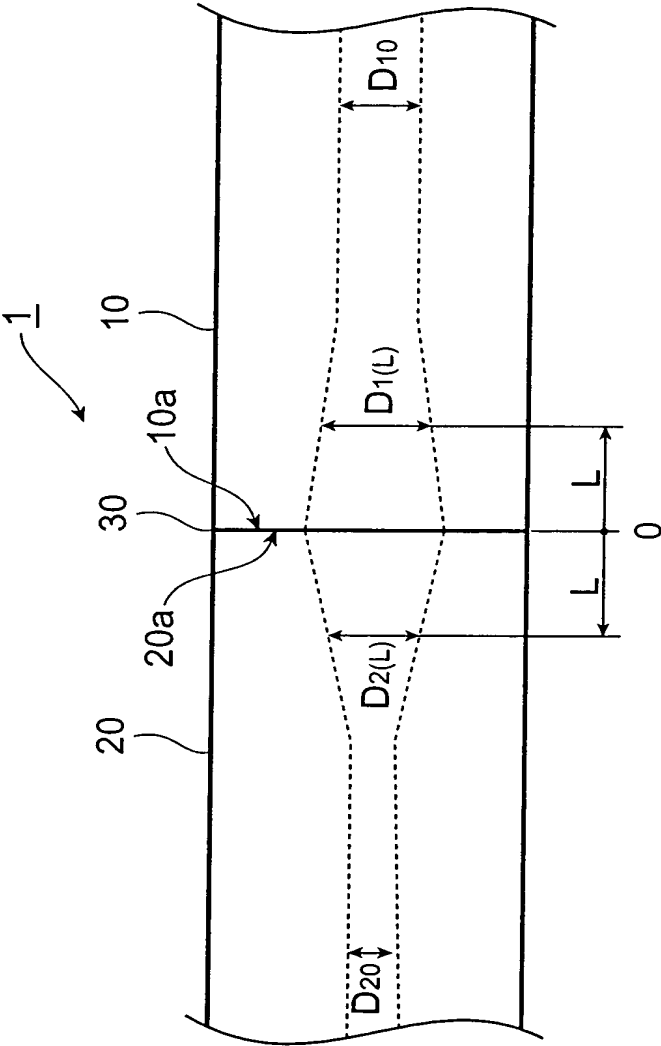
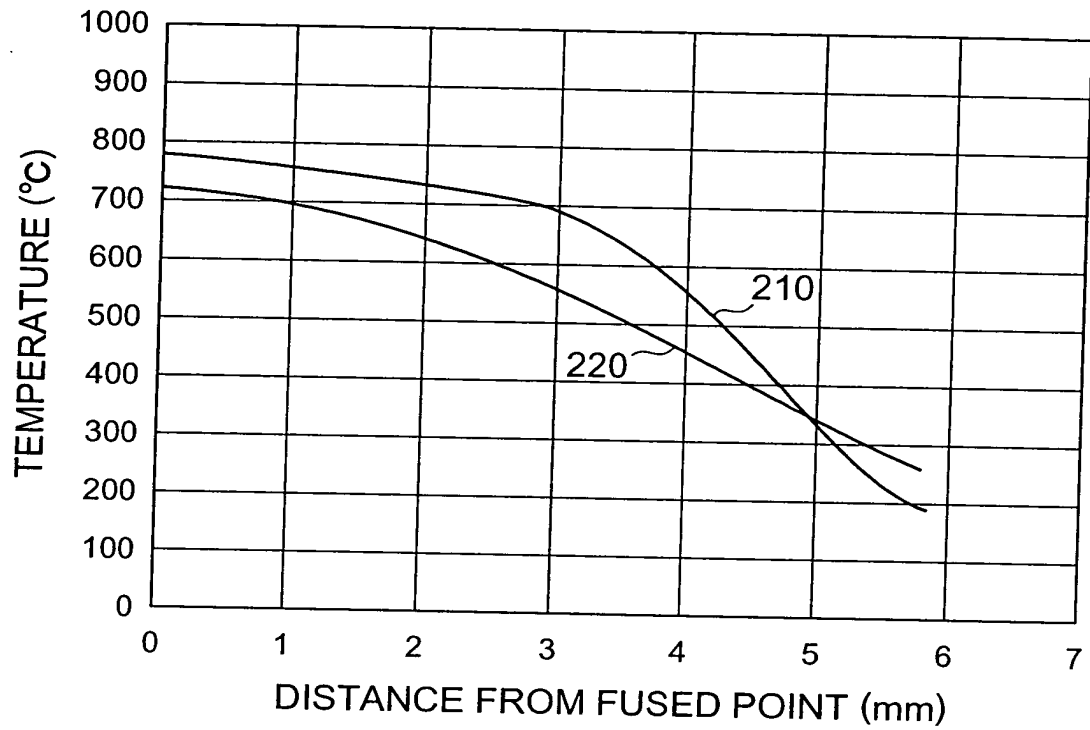
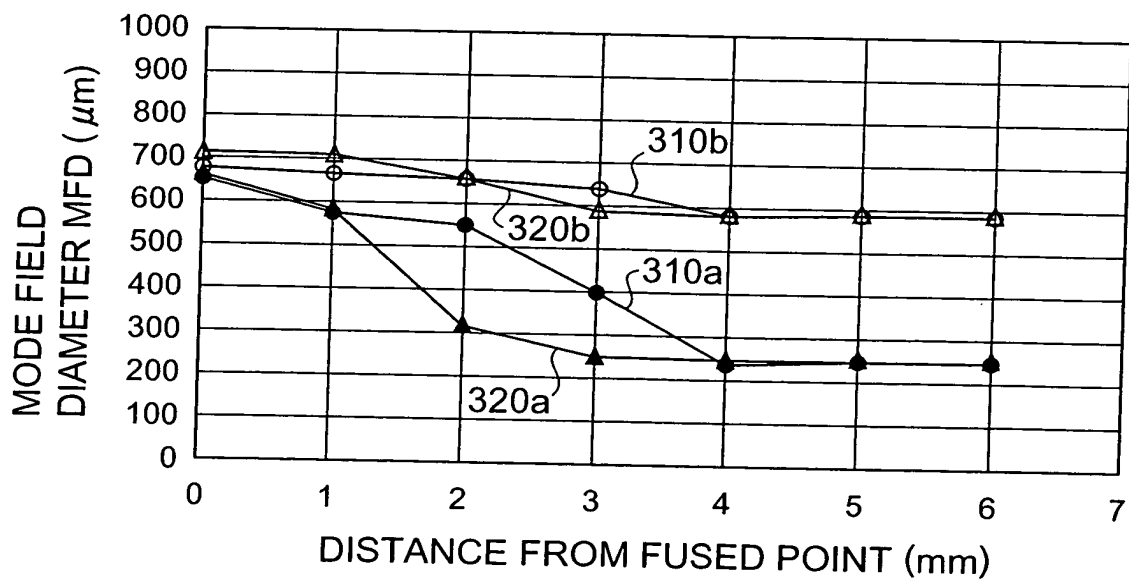


FIG. 1

Fig.1



**Fig.2****Fig.3**

**Fig.4A**

DISTANCE FROM FUDED POINT (mm)	1st OPTICAL FIBER 10		2nd OPTICAL FIBER 20	
	MFD( $\mu\text{m}$ )	RATIO OF CHANGE	MFD( $\mu\text{m}$ )	RATIO OF CHANGE
0	13.1		13.5	
1	11.5	1.6	13.4	0.1
2	11.0	0.5	13.2	0.2
3	8.0	3.0	12.8	0.4
4	4.8	3.2	11.6	1.2
5	4.9	0	11.7	0
6	4.9	0	11.7	0

**Fig.4B**

DISTANCE FROM FUDED POINT (mm)	1st OPTICAL FIBER 10		2nd OPTICAL FIBER 20	
	MFD( $\mu\text{m}$ )	RATIO OF CHANGE	MFD( $\mu\text{m}$ )	RATIO OF CHANGE
0	13.3		14.3	
1	11.7	1.5	14.3	0
2	6.5	5.3	13.2	1.1
3	5.0	1.4	11.9	1.3
4	5.0	0	11.6	0.3
5	4.9	0.1	11.7	0
6	4.9	0	11.7	0

Fig.5A

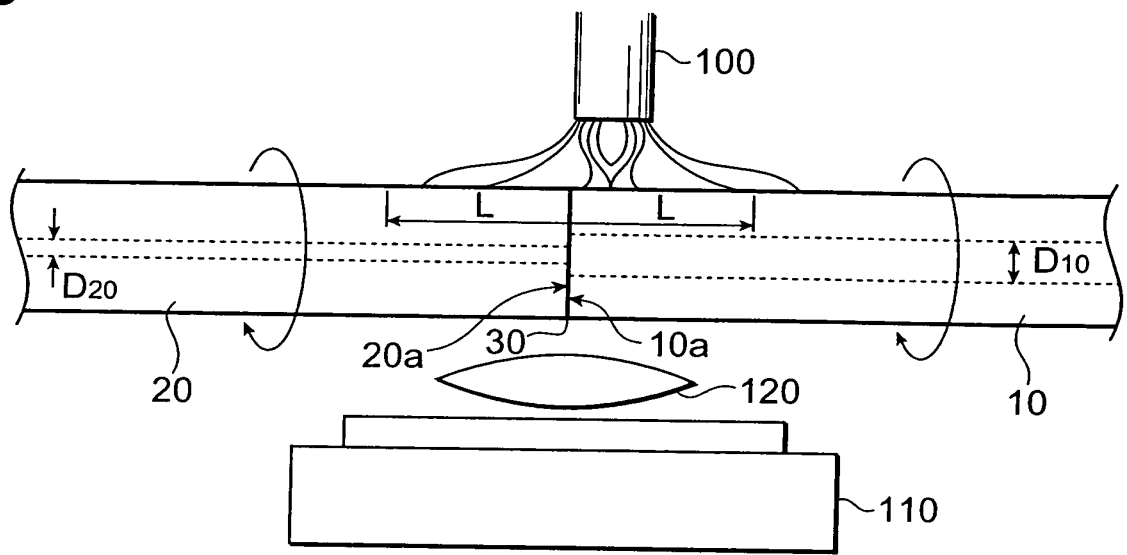
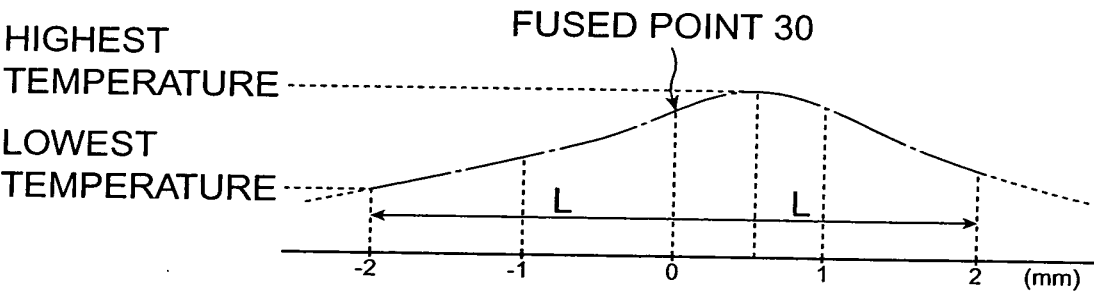
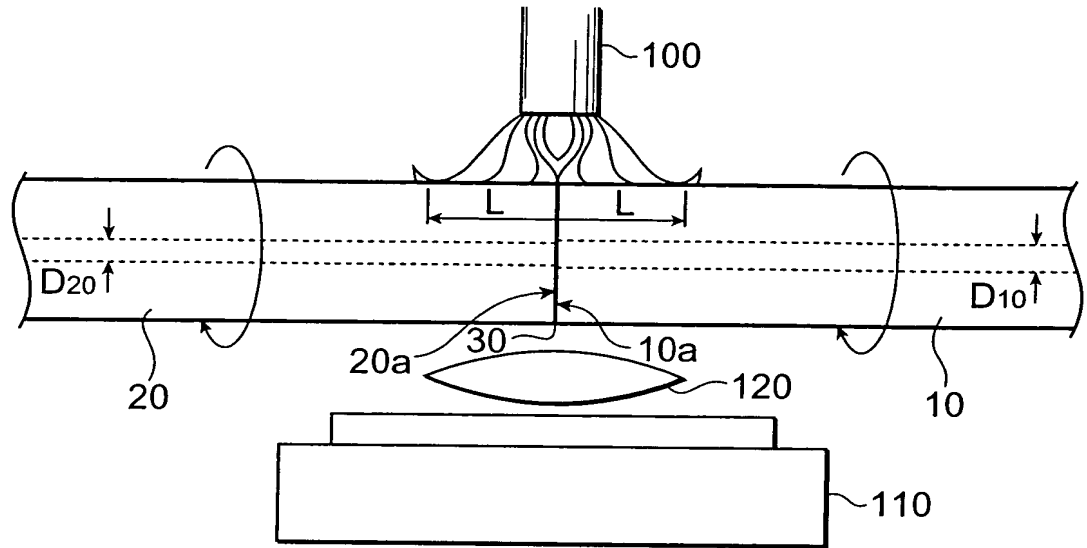


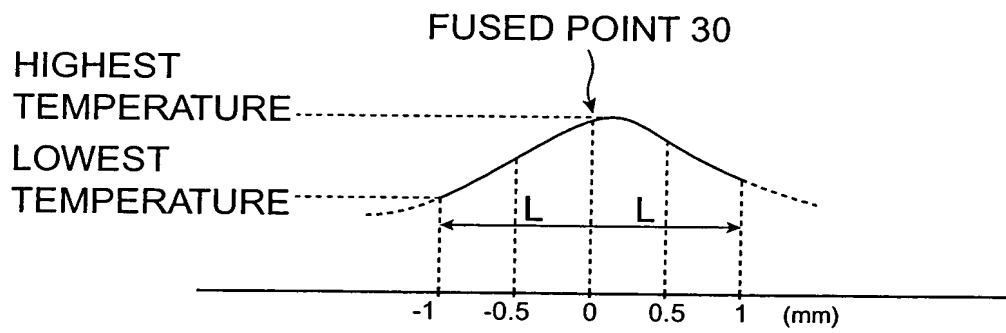
Fig.5B



**Fig.6A**



**Fig.6B**



TEST OF SHELL

Fig.7

1st EMBODI- MENT SAMPLE NO.	1st OPTICAL FIBER 10					2nd OPTICAL FIBER 20							
	D <sub>1(0)</sub> , D <sub>2(0)</sub> ( $\mu$ m)	D <sub>10</sub> ( $\mu$ m)	D <sub>1(2)</sub> ( $\mu$ m)	(D <sub>1(0)</sub> -D <sub>1(2)</sub> )/2 ( $\mu$ m/mm)	D <sub>1(3)</sub> ( $\mu$ m)	(D <sub>1(0)</sub> -D <sub>1(3)</sub> )/3 ( $\mu$ m/mm)	D <sub>20</sub> ( $\mu$ m)	D <sub>2(2)</sub> ( $\mu$ m)	(D <sub>2(0)</sub> -D <sub>2(2)</sub> )/2 ( $\mu$ m/mm)	D <sub>2(3)</sub> ( $\mu$ m)	(D <sub>2(0)</sub> -D <sub>2(3)</sub> )/2 ( $\mu$ m/mm)	L <sub>2</sub> (mm)	SPLICE LOSS (dB)
1	11.2	9.3	10.4	0.4	9.8	0.5	5.1	8.5	1.4	6.2	1.7	3.7	0.15
2	11.2	9.3	10.3	0.4	9.6	0.5	5.1	9.3	0.9	5.3	2.0	3.3	0.14
3	11.2	9.3	9.9	0.6	9.3	0.6	5.1	6.2	2.5	5.1	2.0	2.9	0.31
4	12.2	10.0	10.5	0.9	10.0	0.7	4.6	9.3	1.5	5.3	2.3	4.0	0.17
5	12.2	10.0	10.9	0.6	10.5	0.6	4.6	8.5	1.9	4.7	2.5	3.0	0.17
6	12.2	10.0	11.1	0.6	10.5	0.6	4.6	8.0	2.1	4.7	2.5	3.0	0.25
7	13.5	11.5	12.5	0.5	11.9	0.5	4.8	11.3	1.1	5.0	2.8	3.1	0.11
8	13.5	11.5	12.2	0.7	11.8	0.6	4.8	10.5	1.5	4.9	2.9	3.0	0.15
9	13.5	11.5	12.0	0.8	11.7	0.6	4.8	10.3	1.6	4.9	2.9	3.0	0.21
10	13.5	11.5	12.5	0.5	11.9	0.5	4.8	9.8	1.9	6.0	2.5	3.5	0.16
11	13.5	11.5	12.2	0.7	11.7	0.6	4.8	9.3	2.1	6.0	2.5	3.6	0.22
12	13.5	11.5	12.1	0.7	11.7	0.6	4.8	9.3	2.1	6.4	2.4	4.1	0.25
13	14.5	13.0	13.8	0.4	13.5	0.3	7.0	12.0	1.3	7.3	2.4	3.6	0.15
14	14.5	13.0	13.8	0.4	13.4	0.4	7.0	11.4	1.6	8.0	2.2	4.2	0.17
15	14.5	13.0	13.8	0.4	13.4	0.4	7.0	10.3	2.1	7.0	2.5	4.2	0.22
16	9.7	8.0	9.2	0.3	8.6	0.4	2.0	7.0	1.4	3.0	2.2	4.3	0.13
17	9.7	8.0	9.1	0.3	8.4	0.4	2.0	6.0	1.9	2.1	2.5	3.2	0.19
18	9.7	8.0	8.8	0.4	8.1	0.5	2.0	5.1	2.3	2.0	2.6	2.8	0.30

Fig.8

2nd EMBODI- MENT SAMPLE NO.	1st OPTICAL FIBER 10				2nd OPTICAL FIBER 20				SPLICE LOSS (dB)
	D <sub>1(0)</sub> , D <sub>2(0)</sub> ( $\mu$ m)	D <sub>10</sub> ( $\mu$ m)	D <sub>1(1)</sub> ( $\mu$ m)	(D <sub>1(0)</sub> -D <sub>1(1)</sub> )/l ( $\mu$ m/mm)	D <sub>20</sub> ( $\mu$ m)	D <sub>2(1)</sub> ( $\mu$ m)	(D <sub>2(0)</sub> -D <sub>2(1)</sub> )/l ( $\mu$ m/mm)	L <sub>2</sub> (mm)	
1	6.0	4.5	4.8	0.6	4.5	4.6	1.4	1.0	0.16
2	6.0	5.0	5.3	0.4	4.5	5.3	0.7	1.5	0.13
3	13.5	13.0	13.2	0.2	11.5	12.5	1.0	2.0	0.10
4	13.5	13.0	13.2	0.2	11.5	11.9	1.6	1.4	0.25
5	4.0	3.8	3.9	0.1	2.0	2.4	1.6	1.3	0.26
6	4.0	3.8	3.9	0.1	2.0	2.9	1.1	1.8	0.11

**Fig.9**

3rd EMBODIMENT SAMPLE NO.	TEMPERATURE (°C) AT FUSED POINT DURING HEATING	TEMPERATURE (°C) AT POSITION SEPARATED BY 2 mm FROM FUSED POINT IN 1st OPTICAL FIBER 10	TEMPERATURE (°C) AT POSITION SEPARATED BY 2 mm FROM FUSED POINT IN 2nd OPTICAL FIBER 20	TEMPERATURE DIFFERENCE (°C)	SPLICE LOSS (dB)
1	780	720	730	60	0.10
2	780	670	680	110	0.22
3	900	810	820	90	0.16
4	900	850	860	50	0.08
5	900	800	810	100	0.18
6	950	910	920	40	0.07
7	950	870	880	80	0.11
8	950	800	810	150	0.32

**Fig.10**

4th EMBODIMENT SAMPLE NO.	TEMPERATURE (°C) AT FUSED POINT DURING HEATING	TEMPERATURE (°C) AT POSITION SEPARATED BY 1 mm FROM FUSED POINT IN 1st OPTICAL FIBER 10	TEMPERATURE (°C) AT POSITION SEPARATED BY 1 mm FROM FUSED POINT IN 2nd OPTICAL FIBER 20	TEMPERATURE DIFFERENCE (°C)	SPLICE LOSS (dB)
1	780	720	730	60	0.17
2	780	690	700	90	0.23
3	900	830	850	70	0.22
4	900	850	860	50	0.14
5	900	830	840	70	0.24
6	950	910	920	40	0.10
7	950	870	880	80	0.25
8	950	810	820	140	0.33

**Fig.11**

5th EMBODIMENT SAMPLE NO.	DISTANCE (mm) FROM POSITION YIELDING HIGHEST HEATING TEMPERATURE TO FUSED POINT POSITION	TEMPERATURE (°C) AT FUSED POINT DURING HEATING	TEMPERATURE (°C) AT POSITION SEPARATED BY 1 mm FROM FUSED POINT	SPLICE LOSS (dB)
1	-6	470	350	1.31
2	-5	560	470	0.96
3	-4	620	560	0.72
4	-3	680	620	0.48
5	-2	720	680	0.29
6	-1	750	720	0.16
7	0	780	760	0.10
8	1	760	720	0.17
9	2	720	660	0.32
10	3	660	610	0.50
11	4	610	550	0.73
12	5	550	480	0.91
13	6	400	350	1.20

**Fig.12**

6th EMBODIMENT SAMPLE NO.	DISTANCE (mm) FROM POSITION YIELDING HIGHEST HEATING TEMPERATURE TO FUSED POINT POSITION	TEMPERATURE (°C) AT FUSED POINT DURING HEATING	TEMPERATURE (°C) AT POSITION SEPARATED BY 1 mm FROM FUSED POINT	SPLICE LOSS (dB)
1	-3	650	610	0.55
2	-2.5	680	650	0.44
3	-2	710	680	0.41
4	-1.5	730	710	0.37
5	-1	740	730	0.23
6	-0.5	750	740	0.16
7	0	760	750	0.08
8	0.5	750	720	0.17
9	1	720	690	0.26
10	1.5	690	670	0.36
11	2	670	650	0.43
12	2.5	650	620	0.48
13	3	620	350	0.58

**Fig.13**

7th EMBODIMENT SAMPLE NO.	TEMPERATURE (°C) AT FUSED POINT DURING HEATING	TEMPERATURE (°C) AT POSITION SEPARATED BY 2 mm FROM FUSED POINT IN 1 <sup>st</sup> OPTICAL FIBER 10	TEMPERATURE (°C) AT POSITION SEPARATED BY 2 mm FROM FUSED POINT IN 2 <sup>nd</sup> OPTICAL FIBER 20	TEMPERATURE DIFFERENCE (°C)	SPLICE LOSS (dB)
1	1320	1260	1270	60	0.07
2	1250	1050	1070	200	0.34
3	1120	1050	1060	70	0.13
4	1060	950	960	110	0.22

**Fig.14**

7th EMBODIMENT SAMPLE NO.	DISTANCE (mm) FROM POSITION YIELDING HIGHEST HEATING TEMPERATURE TO FUSED POINT POSITION	TEMPERATURE (°C) AT FUSED POINT DURING HEATING	TEMPERATURE (°C) AT POSITION SEPARATED BY 1 mm FROM FUSED POINT	SPLICE LOSS (dB)
1	-6	930	910	1.01
2	-5	990	930	0.7
3	-4	1050	990	0.65
4	-3	1120	1050	0.48
5	-2	1170	1120	0.27
6	-1	1220	1170	0.15
7	0	1260	1220	0.10
8	1	1210	1180	0.16
9	2	1180	1120	0.34
10	3	1120	1060	0.60
11	4	1060	1000	0.75
12	5	1000	950	0.89
13	6	950	900	1.09